

April, 1950

Vol. XII-No. 3

XTAL

for the

radio amateur

J. H. Peoples, VICE-PRESIDENT
John W. Dunn, SECRETARY
George L. Gandy, TREASURER
\$15.00

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OFFICIAL JOURNAL
THE CANADIAN AMATEUR RADIO OPERATORS' ASSOCIATION
TORONTO, ONTARIO

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150	60	8	150	2750	400	2"	5/8
151	110	8	300	3700	400	2 3/8"	1/2
152	7	40	21	340	400	2"	5/8
153	9	40	32	300	400	2 3/8"	1/2
154	10	65	28	235	400	2 3/4"	1
155	30	40	70	595	400	2 3/4"	1
156	50	30	120	950	400	2 3/8"	1 1/4
157	27	75	68	395	500	3 5/8"	2 1/4
158	10	125	27	155	500	3 5/8"	2 1/4



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Type	Inductance Henry's	Current Ma.	Resistance Ohms	Max. Op. Peak Volts	A	B	C	D	E	F	G	H	I	Weight Lbs.
10-100X	15	100	155	500	2 1/8	1 3/4	2 1/2	3	2 1/2	3 1/2	4 1/2	5 1/2	2 1/2	2 1/2
10-150X	10	150	102	600	2 1/2	1 3/4	3 1/8	3 1/4	3 1/8	3 1/4	3 1/4	3 1/4	4 1/4	4 1/4
10-200X	10	200	82	800	2 1/2	2 1/4	3 1/8	3 1/4	3 1/8	3 1/4	3 1/4	3 1/4	5 1/2	5 1/2
10-300X	10	300	63	800	3	3	3 1/4	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	10 1/2	10 1/2
10-500X	10	500	53	1000	4 1/8	3 1/4	5	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2	5 1/2	21
30-65X	30	65	380	500	2 1/8	1 3/4	2 1/2	3	2 1/2	3	3	3	2 1/2	2 1/2
30-100X	30	100	280	500	2 1/2	2 1/8	3 1/8	3 1/4	3 1/8	3 1/4	3 1/4	3 1/4	4 1/4	4 1/4
30-150X	25	150	190	800	3	2 1/2	3 1/4	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	4	8
30-200X	26	200	152	800	3	3 1/8	3 1/4	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	11 1/2	11 1/2
30-300X	30	300	144	1000	4 1/8	4	5	6 1/2	6 1/2	6 1/2	6 1/2	6 1/2	5 1/2	21 1/2

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(C R Y S T A L)

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60

APRIL, 1950

Excerpts from the President's Report presented to a meeting of the Executive Committee held at Brantford, Ont., on February 25, 1950.

A central executive committee which is the sole administrative body is, in my opinion, an administrative weakness.

I believe our administrative system creates a gulf tending to isolate the individual member from the affairs of his association. I am confident that, in the minds of some members, CAROA exists in the abstract. It is something to which they give support by the payment of annual dues, and yet they seem to know very little about CAROA, for they are seldom told what the association is doing or intends to do. They are members of CAROA and yet they do not feel a part of it. To them, the association is an impersonal thing instead of something which is an intimate part of their amateur radio life. If CAROA is such an abstract and impersonal thing, it is due to our administrative system which does not let us get closer to the individual member, or which does not bring him closer to the administration of the affairs of his association.

It is of the utmost importance that the individual member, in some way, be brought within the circle of association activity. He must be given the opportunity of participating in a discussion of CAROA affairs. Our administrative system should provide for members across the country participating in discussion groups on matters which affect the hobby on the national level, and CAROA should be the agency for co-ordinating the conclusions of such discussion groups, and forging them into a national policy for the taking of action in conformity with majority expression.

Membership in CAROA must mean something more than the possession of a card which confirms the fact of membership. It must mean more than the right to receive XTAL gratuitously. Membership must have a value that stems from the service potential of the association.

By amending our administrative system to provide for more membership cohesion in CAROA affairs, we shall serve the two-fold purpose of giving a value to membership, and of building co-ordinated strength throughout the hobby in Canada.

I distributed to members of the executive some months ago, a draft outline of an administrative system which I believe superior to our present system. I shall ask the privilege of introducing that suggestion later this evening.

Another matter which demands our attention is the declaration of practical objects of purpose. I am convinced there is a degree of disinterest in our association because there is not a general understanding of our purpose.

A merchant who opens his shop with nothing to sell might better keep his doors closed. If we believe in the idea of a national association in Canada, it must be because of specific reasons, or for specific purposes. We cannot support the idea of a national association merely for the abstract purpose of having one. We can only stand behind the idea if we believe it has a practical and useful function to perform. It must have objects of purpose — practical objects rather than academic.

Having clearly settled in our minds that there is a need for a national association, and having a well-defined understanding of the field the association is to serve, and the manner in which it will serve, we must then publicize our convictions, and constantly keep the purposes and work of the association in front of those whom the association is endeavouring to serve.

Adherents and supporters are never lacking for a worthy cause adequately defined. Conversely, no matter how laudable the purposes of an organization may be, we cannot reasonably expect to muster general support for a nebulous philosophy inadequately presented. We must offer more than the academic concept of a good idea.

75-METER MOBILE

By ALEX VELLEMAN, VE3BTQ

First of a series of articles
describing a complete mo-
bile station for 75 phone.

MANY articles have been written on parts of mobile rigs, and on antennas for this type of operation, but as yet I have not seen a complete set of articles showing a mobile rig complete from transmitter right through the control system, antennae and receiver or receiver-converter.

This article does not pretend to be completely original, nor do I pretend that I personally have designed all of the features that are incorporated in it. What these articles do feature is a complete assembly of a quantity of information gleaned from here, there and everywhere. What you should have is a car, complete with auto radio, and a mess of junk parts, and the willingness to do a quantity of work.

The basic transmitter is a simple Pierce oscillator feeding a plate-tuned final amplifier. The Pierce oscillator was chosen so that it would not be necessary to tune the oscillator. This is desirable in mobile work, where a minimum of controls is a requisite. A 6C4 was chosen because of the small space it requires, and because of the low filament drain, as well as the quick-heating feature of the tube. It was found that the 6C4 gave adequate drive to an 807. An 807 was used as the PA because not only was the 807 a readily available tube, but because of the small amount of drive it needed, and the willingness of the 807 to work under low plate voltages together with low filament voltage. The PA is parallel fed. DC is fed to the PA plate through an RF choke rather than through the plate coil so there would be no possibility of having a high DC voltage on the antenna. A small coupling condenser is used to couple the PA to the RF coil, which is tuned in the conventional manner. The antenna may either be link-coupled to the final, or direct-coupled, depending on which of the taps are used.

The modulator system is very simple. Another 6C4 is used, this time for a speech amplifier. The cathode voltage is also used as polarizing voltage for microphone. The reason for doing this is because of the m/g hash that is now found on the 6-volt DC line from the car battery. A 6L6 modulator is employed, running class "A" to a Heising choke.

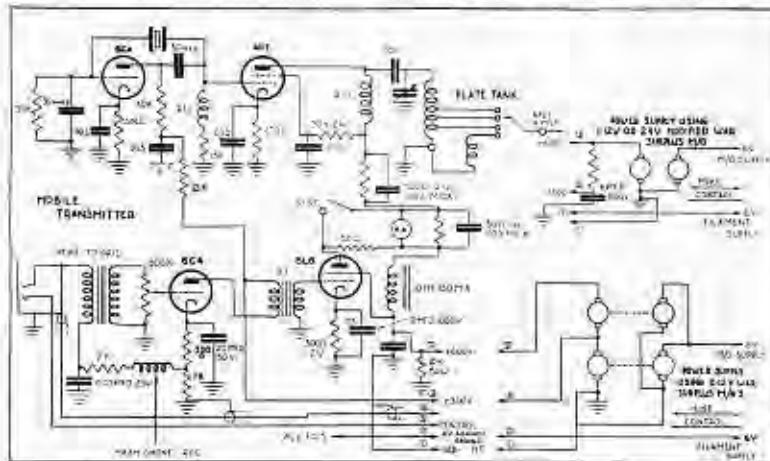
Power for the plates of the tubes is the large problem, and this takes up the major portion of your time and trouble. Now a P103 is a nice thing to have, and so is any 6-volt m/g, but these are not readily available, nor are very many

supplies that will give 300 and 600 volts, with about 125 mills on the 600-volt tap and 35 mills on the 300-volt tap.

Let's look at the motor-generator market. There are three normal sources: (1) American war surplus gear; (2) Canadian war surplus gear; (3) purchase of a new one from the wholesale store.

For economic reasons, (3) is out. Let's get down to cases. If a 6-volt war surplus generator is available, there is no more worry, but if you're like most of us, you'll have around the shack a mess of 12 and 24-volt American and Canadian m/g's, and here's what can be done with them:

1. If you have a pair of 12-volt American units, take out the armatures, and remove the linen covering the windings. If you find the heavy



wire for primary voltage on the outside, you're in luck. See the paragraph on Eicor units further on. If however, the fine wire, or high-voltage secondary is on the outside, just replace the linen, and shellac over it. Before replacing the armature, however, connect the two field windings in parallel, rather than in series as you will find them.

2. If you have a single 24-volt American unit, and the low-voltage winding is on the outside, follow paragraph on Eicor. If the high-voltage winding is on the outside, there's nothing to be done, unless you are really handy with the armature winding trade.

3. If you have a single Canadian 12 or 24-volt unit on hand, you'll more than likely find that it's an Eicor. The majority of Eicor motor-generators have the secondary nearest the core, and the primary on the outside. Here's the dope, and when removing the wire from it, take very careful notes. (1) Count the number of turns on each of the segments, and mark the start and finish segments of both the first and last

windings very carefully. (2) When preparing the armature for removal of the primary winding, preserve the wedges of fibreboard, or other insulating material. These must go on the finished article, and are very important. (3) Measure the wire size and obtain replacement wire in the following categories: If the old primary is 24 volts, and the new operating voltage is to be 6 volts, the new wire size must be capable of carrying four times the current. However, if the old primary is 12 volts, and the new one is to be 6 volts, then the new wire size need only carry twice the current. Check with your wire tables, and check for the circular mill area. This is the clue you need. For example, if the old wire size is 18, its mill area is approximately 1624. Double this would be 3248, and the nearest to this is 3257, which is No. 15 wire. The new secondary should be wound of No. 15 wire, if the old one was 12 volts, and remember that only half the number of turns are required for those found on the 12-volt unit (and a quarter of those found on the 24-volt unit with four times the current-carrying capacity or mill area).

Before replacing the armature, either remove the field coils and rewind them with double the mill area wire and half the quantity, or else merely place the two fields in parallel. This system of placing the fields in parallel will create a high starting current, but it will cause the m.g. to reach operating speed more quickly.

Filters for the m.g. supply were "robbed" from the same source as the m.g.'s came from, and were hooked up in the same manner.

Now for the owner of the two 12-volt units that cannot be rewound. If the primaries of these units are fed with 6 volts, it will be found that the output stage is half of the rated voltage, but the output current is exactly as rated. Suppose that we take two of these units, and hook up the primaries in parallel, and the secondaries in series . . .

In this event, the output of each of the units with the rated input would be in the vicinity of say 600 volts at 200 ma. If the units are fed with 6 volts, and the secondaries are in series, the output would be approximately 600 volts at 200 ma.

Control circuits are another problem. They will be discussed in other articles, as well as aerials, converters, etc. The entire transmitter was mounted in an old SCR211 case. The upper shelf is used for the RF and modulator section, and a plug connects this unit to the balance of the transmitter.

Fig. 1 shows the RF and modulator section, and employs a 7-pin plug and socket assembly for power and antenna connections. Power requirements are: 600 volts @ 125 ma, 300 volts @ 35 ma, at least one control line, and an antenna terminal, together with possibly a ground connection and a 6-volt line.

We would like to publish pictures of hams and ham stations, but finances will not permit the purchase of half-tone cuts. If any of our members have cuts for use in their QSL cards, etc., we would welcome their submission on a loan basis.

10-METER AMB/FO/BQX BEAM

Here is the constructional dope on a three-element beam being used by VE3AMB, FO and BQX with exceptional results. We are unable to give all the technical data regarding field tests, etc., because the beams were constructed late in the fall. Performance has been outstanding, although one station has used only 28 watts and another 35 watts.

Standard formulae were used for dimensions, with those for 28350 Kc given. For other frequencies, use 475 divided by frequency in megacycles for the radiator, 455 over frequency for director, and 500 over frequency for reflector.

The reflector here is 17' 7" total length, 13 feet of inch tubing with 3' extensions of $\frac{1}{8}$ " tube. The director is 16' over all, of inch and $\frac{1}{8}$ " tube. The reflector is spaced 60° from the radiator, and the director 40°.

The radiator is a folded dipole, the top section being made of inch tubing 13' long extended to 16' 9 $\frac{1}{2}$ " by 3' pieces of $\frac{1}{8}$ " tubing. The outer portions of the lower section are 5' lengths of $\frac{1}{8}$ " tubing, with telescoping 5' lengths of $\frac{1}{8}$ " tubing extending inward to the feed point.

Both twin BA4M and RG8U feeder cables have been used, with equal results.

The boom is made of 2" dural tubing. The elements are passed through holes in the boom and secured at the centre by $\frac{3}{8}$ " bolts, the hole in the top of the boom having been enlarged to pass the bolt-head. All the drilling was done at a local machine shop.

Now to attach the boom to the 1 $\frac{1}{4}$ " rotor shaft. A floor flange on the end of the shaft is bolted to a 4x4" piece of $\frac{1}{8}$ " boiler plate. The boom is secured to the plate by two exhaust pipe clamps obtained at an auto parts dealer.

The front to back ratio with this beam is between 25 and 30 db. We suggest that if you can't work out with this beam, with 28 to 33 feet of height, then better just give up and use Aldis lamps or flags. You just don't live right.

—A. E. Wilson, VE3AMB.

TV Note—The C.B.C. has been assigned two channels in Montreal and one in Toronto. Channel 2, 54 to 60 Mc, will be the first used in Montreal, with Channel 5, 76 to 82 Mc, to follow. Toronto TV will be on Channel 9, 186 to 192 Mc.

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DX DOINGS

By H. Langstaff, VE3FO

HELL GANG! We are starting our job at a rather inopportune season for the high frequencies, but will endeavor to start the ball rolling by giving you some information as to how I hope to edit this column.

I will have to receive help from you other dxers in VE land. I can give the dope on VE3, but how about the other call areas? Let me know about your dx achievements and stations heard, with their frequencies, and also the QTH's of hard-to-get stations. The definition of dx depends on the frequencies used. By this I mean that 10,000 miles on one band may be dx, while 100 feet on another would also be dx. Regardless of the band you work, be it 80, 40, 20, 10, 6, 2½ or 420, drop us a line and let us know your best dx. We will arrange skeds on 420 for the local hams on that band.

Signals on 10 have been very irregular, and all indications are the beam-changing time is approaching. The VE6's and 7's have been absent from the band in Ontario for a few weeks, so transcontinental QSO's are through, except for sporadic openings.

VE3BRO and VE3AVJ are doing dx across Toronto on 235 Mc.

Eighty, as usual, seems to open up when it is time to get some shut-eye. Some real openings have been heard occasionally. Central and South Americans and G's have been heard. WB's have been heard working ZL's.

Has anyone heard any dx on 160? VE1EA has worked five G zones on 160.

Low-power dx — VE3AFK at Aurora is running a 19 set with five watts input on forty. On December 24 he worked XE1SA.

VE1ET worked 45 countries in 126 contacts in the phone dx contest. VE1OM worked UPZ on 20 phone with his little AC-DC two-watter recently.

After 19 years of trying to score WAC, VE3IG made the grade by working TA3GVU in Turkey. Harold also completed contacts for WAVE.

This is my first effort on this column, and I hope to make it more interesting in future. It depends to large degree on the assistance forthcoming from all VE's.—73.

Send the dope to VE3FO, 201 St. John's Rd., Toronto.

BOOK REVIEW

"Radio Operating Questions and Answers" (J. L. Horning) — McGraw-Hill Company of Canada, Toronto; 36.50.

This book contains 1,763 questions and answers based on requirements of the F.C.C. commercial operators' examinations. Its chief value to Canadian amateurs will be as a review preliminary to oral tests. The answers given are splendid examples of the art of giving complete answers in few words, and will be helpful in overcoming the mental hazard attached to all oral examinations.—3ZE.

TRAFFIC LANES

MARCH TRAFFIC SCORES

3BUR	180	3ASL	16
3BBM	25	3ATR	132
3DBJ	7	3IA	188
3WK	81	3APS	53
3ANO	53		

Art Palmer, VE3WK, has been appointed Emergency Co-ordinator for the 40-meter band. He requests us to inform all hams that 7267 kilocycles is the emergency calling frequency.

VE5DN, EE and HR have been appointed OBS and IC and MA as OO, JK as OES, KQ as EC, SE as SEC, YF as OPS. 5HR now holds OBS, RM, ORS and TLS. He transmits bulletins at 2000 hours MST Monday and Wednesday on 3584 Ke and on Saturday at 1630 on 7052 Ke. 5MA, FY and UC are working well with their mobile rigs.

AFARS NEWS

By M. G. Caveney, VE3GG

A meeting of the squadron controllers of No. 4 Area was held in the R.C.A.F. officers' mess on Eglinton Ave., Toronto, on March 10.

Squadron Controllers Ken Reid and Bill White and A.S.C. Art Ferguson were picked up by plane at Camp Borden, Hamilton and London, respectively.

Many important matters were dealt with, including the proposal to include the whole of Ontario in what is now known as No. 4 area; rearrangement of squadron areas to facilitate closer contact of squadron leaders with members, and the formation of a Northern Squadron.

It was also decided to arrange hamfests by squadrons, followed by an area hamfest.

After dinner, the squadron controllers were returned to their homes by R.C.A.F. plane and cars.

REGULATIONS REGARDING MOBILE OPERATION

Mr. S. J. Ellis, District Superintendent of Radio, Toronto, has sent to CAROA a copy of the following letter from Ottawa:

"In order that an amateur may utilize to full advantage the time allowed under his license for portable operation, it is suggested that interpretation of Paragraph (e) — Portable or Mobile Operation, be assumed to imply that a station may operate in this manner for a total of 120 days within the period April 1st to March 31st in any fiscal year.

(Signed) E. Bennett,
for G. C. W. Browne,
Controller of Radio."

In The Realm Of Clubs

The regular monthly meeting of the Hamilton A.R.C. was held on March 16. Len Hammond of the Hammond Manufacturing Co. was guest speaker. Len gave us a 16 talk on interstage transformer design and operation. George Crawford, gave an interesting talk on his experiences with the harmoniker and its effectiveness in reducing TVI. Wibb Clemence, 3KM, conducted field day discussions and planning. George and Bill Crawford donated four complete harmonikers to the Club and took on the responsibility of their assembly. The balance of the meeting was taken up with a draw and an auction. The prizes in the draw were a new handbook and a carpenter square, donated by 3BNQ. After adjournment most of the 62 present stayed over for the usual rag-chews and coffee and donuts.

Recent election of officers at the Kitchener-Waterloo A.R.C. placed the following in office: President, Bruce Underwood, VE3ANU; Vice-president, Jack Fortune, 3BGD; Secretary, Gordon Moogh, 3DBP.

The tenth birthday party and annual meeting of the Kirkland Amateur Radio League was a bang-up affair on April 1. VE3BDS and AHK, Cochrane; AZZ and BWW, Timmins; EAW, North Bay; 2SC, Peron, and 2ABS, Val d'Or, were out-of-town visitors. Officers installed were: President, Alex. Snider, 3PA; vice-president, Hal Grover, 3BJE; secretary-treasurer, Archie Archibald, 3BNI, and activities manager, Ken Bowers, 3BHY.

At the March 29 meeting of the Montreal A.R.C. Ed Hayes of the C.B.C. spoke on "Antenna Lines and Relays."

Saskatoon A.R.C. heard a talk on television by Wes Fisher of RCA at the March meeting.

Ron Hook, radio engineer with the Department of Natural Resources, Prince Albert, was guest speaker at the February meeting of the Saskatoon A.R.C. Mr. Hook gave a detailed account of the work being done in the Northern Saskatchewan Forests. He stated that through experience they have found the type of equipment best suited for their purpose and now have a workshop in Prince Albert where this equipment is built and tested. He also stated that his department supplies radio communication to all branches of the Provincial Government in the vast Northland, not the least of which is the Saskatchewan Government Airways operating twenty-five aircraft. In his spare time Ron is trying to get his own station (5EY) on the air, but is a busy man indeed.

Easter travellers—Jack Beardall, 3MJ, reported from Washington, D.C., where he spent an Easter holiday. Ye editor, 3ZE, visited up London way, using the last bit of mileage in his jalopy.

CAROA EXECUTIVE COMMITTEE MINUTES

CONDENSED minutes of executive meeting held in Kitchener, Ont., April 16, 1950. The meeting was called to order by the president at 11:45 a.m. with the following members and visitors present: VE3RG, YS, MJ, AAZ, ZE, ANU, HP, BYT, AZH, ANO, APS.

Reading of the minutes of the previous meeting postponed till a later meeting when they could be more fully discussed.

Mr. Powell, VE3ZE, read a report on the publication and production of XTAL, advising that the April issue was in the hands of the printers and would be a 12-page issue. The dedication of XTAL to separate call areas would begin with the September issue, the deadline for copy, etc., for that issue being Aug. 12. The deadline for all issues in future will be the twelfth of the month preceding month of issue. He requested direction as to the steps to be taken in the readjustment of the rates for advertising for display ads for local issues and for Ham-ads.

A motion that the rate suggested by the Publications Manager be adopted for the dedication issues in respect to local advertisers was carried.

Discussion ensued on the use and misuse of Ham-ads. The consensus of opinion was that the publications department should enforce the ruling that the preferred rate be confined to members of CAROA for non-commercial purposes only. A motion that the Publications Manager be authorized to establish rates for Ham-ads in accordance with his best judgment was carried.

Mr. Stephens, VE3YS, gave a report on the membership files, etc., giving an approximation of the present number of paid-up memberships. A motion that the thanks of the executive committee be extended to Mr. Beardall, VE3MJ, for his efforts in compiling and bringing up to date the membership records was carried.

A discussion on the possibilities of increasing the membership followed, and Mr. Stephens suggested that a letter be sent to all non-member amateurs telling them of the purposes and aims of the association and soliciting their support. Mr. Beardall volunteered to carry out the suggestion of Mr. Powell, that a survey be made to discover the best means of approach, and to report back to the executive committee giving his recommendations as to the type of approach to be made.

The subject of holding a Canadian Amateur Radio Week was again brought up by Mr. Beardall, and it was the opinion of the assembly that further research be undertaken prior to any definite decision being made, the event to be held in the late autumn if at all possible.

A motion that CAROA request permission of the Ontario Fone Club to operate a CAROA booth at the Fone Club picnic to be held on July 9 next, carried.

Some discussion followed as to the advisability of CAROA sponsoring further contests for competition amongst Canadian amateurs. It was decided to leave this matter over till the conclusion of the VE/W contest, using participation in it to

(Concluded on next page)

COUPON

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REMIT TO: The Canadian Amateur Radio Operators Association, 46 St. George Street, Toronto, Canada.

EXECUTIVE MINUTES

(Continued from page 9)

determine the possible interest of contests to Canadian amateurs.

The possible deletion of the National Report from the columns of XTAL was discussed. A motion that the use of the heading "National Report" be discontinued and that the various district representatives be advised to break down their reports in future into Club News, DX, VHF, etc., carried.

Meeting adjourned at 2:50 p.m.

BACK ISSUES OF XTAL

The growing number of back issues of XTAL and a fixed amount of storage space has forced the decision to make available to members all except our file copies of XTAL. They are obtainable at a price of five cents per number, eight for 25 cents, to cover handling costs. This is your chance to complete your files. The supply of some issues is very limited. Get them now.

1950, Vol. 12 — January.
1949, Vol. 11 — Jan., Feb., March-April, May-June, July-August, Dec.
1948, Vol. 10 — Jan., March, April, May, Oct., Nov., Dec.
1947, Vol. 9 — Feb., March, May, June, July, Aug., Sept., Oct., Nov.-Dec.
1946, Vol. 8 — Jan., March, April, June, July-Aug., Sept., Oct., Nov.
1945, Vol. 7 — June, Aug.-Sept.

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3. Copy must be received by the 10th of the month preceding date of issue.
4. Remittance must accompany order.

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MESSAGE BLANKS—Now available at 35 cents per 50, 3 pads for \$1, postpaid anywhere in Canada. Order from CAROA, 46 St. George Street, Toronto 5, Ontario.

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JULY 9—Bayfield, Ont.; Ontario Phone Club; tickets 50 cents, all under 14 years free.

Send in announcements for this list to CAROA.

HAMMOND — NEW TYPES

Type	Specifications	Mfg.	Core Size	Mfg. cts.	Your Cost
FILAMENT TRANSFORMERS					
165 B 25	Pri. 115 volts, 25 cy. 10 watts. Sec. 5.0 volts, 2 amps.	Brkt.	7/8 x 7/8	316	
165 B 60	Pri. 115 volts, 60 cy. 10 watts. Sec. 5.0 volts, 2 amps.	Brkt.	3/4 x 1	248	\$2.67
POWER TRANSFORMERS FOR SELENIUM RECTIFIERS					
262 B 25	Pri. 115 volts, 25 cy. 4 watts. Sec. 120 volts, 15 ma. d.c. 6.3 volts, 0.3 amp.	Brkt.	3/4 x 3/4	234	
262 B 60	Pri. 115 volts, 60 cy. 4 watts. Sec. 120 volts, 15 ma. d.c. 6.3 volts, 0.3 amp.	Brkt.	3/4 x 3/4	234	2.10
262 D 25	Pri. 115 volts, 25 cy. 8 watts. Sec. 120 volts, 30 ma. d.c. 6.3 volts, 0.6 amp.	Brkt.	3/4 x 1 1/4	234	1.89
262 D 60	Pri. 115 volts, 60 cy. 8 watts. Sec. 120 volts, 30 ma. d.c. 6.3 volts, 0.6 amp.	Brkt.	3/4 x 3/4	234	3.02
262 F 25	Pri. 115 volts, 25 cy. 16 watts. Sec. 120 volts, 75 ma. d.c. 6.3 volts, 1.0 amp.	"X"	1 x 1	1 3/4 x 2 1/4	2.04
262 F 60	Pri. 115 volts, 60 cy. 16 watts. Sec. 120 volts, 75 ma. d.c. 6.3 volts, 1.0 amp.	Brkt.	7/8 x 7/8	316	3.19
					2.74
BIAS TRANSFORMERS					
263 C 25	Pri. 115 volts, 25 cy. 75 watts. Sec. 180 — 0 — 180 volts, 250 ma. d.c. 5.0 volts, 3 amps. c.t.	"X"	1 1/2 x 1 1/2	3 x 2 1/2	
263 C 60	Pri. 115 volts, 60 cy. 75 watts. Sec. 180 — 0 — 180 volts, 250 ma. d.c. 5.0 volts, 3 amps. c.t.	"X"	1 1/2 x 1 1/2	2 1/2 x 2 1/2	7.70
					5.45
POWER TRANSFORMERS					
272 B 25	Pri. 115 volts, 25 cy. 86 watts. Sec. 300 — 0 — 300 volts, 100 ma. d.c. 5.0 volts, 2 amps. 6.3 volts, 3 amps.	"X" or "Z"	1 1/4 x 2 3/4	Z — 3 1/8 x 2 1/2	
				X — 2 1/2 x 3 3/4	6.85
272 B 60	Pri. 115 volts, 60 cy. 86 watts. Sec. 300 — 0 — 300 volts, 100 ma. d.c. 5.0 volts, 2 amps. 6.3 volts, 3 amps.	"X" or "Z"	1 1/4 x 1 1/2	Z — 3 1/8 x 2 1/2	
				X — 2 1/2 x 2 1/2	5.40

SEND FOR LIST OF SPECIAL CURRENTLY AVAILABLE TYPES

TELEVISION

27. Tube TV Kit, complete with 10BP4 Picture Tube, 25 or 60 cycle 315.00

TV HIGH PASS FILTER

Miller No. 6168 effectively diminishes spurious signals which may be picked up by the IF amplifier section of TV set. This unit designed to attenuate all signals from 0-40 Mcs. All television channels passed with minimum loss \$4.50

B & W FARADAY SHIELDED LINKS

To Help Eliminate TVI

3582 2 Turn Link, 500 Watt	6.25
3583 3 Turn Link, 500 Watt	6.25
3589 Link Arms and Hinge Assembly	3.31
Above items for use with BVL, TVL and TVH Series Colls.	
3782 2 Turn Link, 1000 Watt	6.64
3783 3 Turn Link, 1000 Watt	6.64
3789 Link Arm and Hinge Assembly	3.68
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50 MMFD Cardwell Screwdriver Shaft .25
75 MMFD Air Padder Type Variable .39

SYLVANIA

IN34A Germanium Diode 1.50
IN35 Matched Pair of IN34 3.95
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B & W MINIDUCTORS

Specifications

Catalog No.	Diameter	Turns per in.	Length	Your Cost
3001	1/2"	4	2"	.47
3002	1/2"	8	2"	.47
3003	1/2"	16	2"	.47
3004	1/2"	32	2"	.47
3005	5/8"	4	2"	.53
3006	5/8"	8	2"	.53
3007	5/8"	16	2"	.53
3008	5/8"	32	2"	.53
3009	5/8"	4	2"	.63
3010	5/8"	8	2"	.63
3011	3/4"	16	2"	.63
3012	3/4"	32	2"	.63
3013	1"	4	3"	.74
3014	1"	8	3"	.74
3015	1"	16	3"	.74
3016	1"	32	3"	.74

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